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First Printing — February 1996

Using This Guide

This *Versa® 2200C Series User's Guide* contains information on using your notebook computer. Read the following chapters to find out more about the system.

- Chapter 1 introduces the computer, its features, and how to care for it.
- Chapter 2 explains how to use the NEC Versa 2200C hardware.
- Chapter 3 describes the software that comes with your NEC Versa 2200C.
- Chapter 4 discusses traveling with your NEC Versa 2200C.
- Chapter 5 gives you a checklist to follow if you have problems with the NEC Versa 2200C. Common problems and their solutions are also included.
- Chapter 6 provides a list of numbers for NEC customer support services.

⚠ WARNING

Prolonged or improper use of a computer workstation may pose a risk of serious injury. To reduce your risk of injury, set up and use your computer in the manner described in Appendix A, Setting Up a Healthy Work Environment.

- Appendix A, Setting Up a Healthy Work Environment, contains guidelines to help you use your computer productively and safely. This appendix also instructs you on how to set up and use your computer to reduce your risk of developing nerve, muscle, or tendon disorders.
- Appendix B, Specifications and Environment, provides system specifications and environment recommendations.
- Appendix C, Modem Commands, Codes, and Registers, lists commands, registers and for network communication use via the optional internal modem or a PC card modem.

TEXT SETUP

To make this guide as easy to use as possible, text is set up in the following ways.

- Warnings, cautions, and notes have the following meanings:

> **⚠ WARNING**
> Warnings alert you to situations that could result in serious personal injury or loss of life.

> **⚠ CAUTION**
> Cautions indicate situations that can damage the system hardware or software.

NOTE Notes give important information about the material being described.

TIP: Tips give helpful hints about getting the most out of your system.

- Names of keys are printed as they appear on the keyboard, for example, Ctrl, Alt, or Enter.
- Text that you have to type or keys that you must press are presented in bold type. For example, type **DIR** and press **Enter**.

RELATED DOCUMENTS

In addition to this guide, a number of other documents ship with your Versa system, including:

- The NEC *Versa 2200C Notebook Quick Setup* shows you how to set up your system after you unpack it.
- The *Versa 2200 Series Quick Reference Guide* contains brief descriptions of function keys, LEDs, NEC Help telephone numbers and troubleshooting tips.

  Tuck this card inside the closed notebook when you take it with you. The card is designed as a quick, portable reference to frequently-used functions.

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1 Getting to Know Your NEC Versa 2200C

⚠ WARNING

Prolonged or improper use of a computer workstation may pose a risk of serious injury. To reduce your risk of injury, set up and use your computer in the manner described in Appendix A, Setting Up a Healthy Work Environment.

After completing the steps in the *Quick Setup* sheet that comes with your computer, your NEC Versa 2200C is ready to go! It's packed with features to make your work experience fun and productive. To get started, look at the following:

- Read Appendix A, Setting Up a Healthy Work Environment, for guidelines that help you use your computer productively and safely. Information includes how to set up and use your computer to reduce your risk of developing nerve, muscle, or tendon disorders.
- Take the online *System Tour* to get acquainted with the NEC Versa 2200C. (The *System Tour* is located in the Windows NEC Information group under the NEC Versa 2200C InfoCenter.)
- Wander through the online system *Basics*. (*Basics* is in the Windows NEC Information group under the NEC Versa 2200C InfoCenter.)
- Flip through this guide to familiarize yourself with the NEC Versa 2200C.

AROUND THE SYSTEM

The NEC Versa 2200C is light and compact with features all around it.

Front

Take a look at the front of the NEC Versa 2200C.

Front of system

LCD Screen

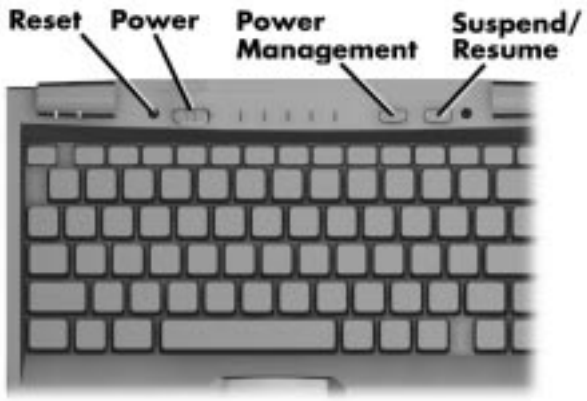
Your NEC Versa 2200C comes with a 9.5-inch color TFT (Thin Film Transistor) active-matrix display.

Brightness Control

You can adjust the screen backlight brightness with the control slide switch located on the side of the screen.

Switches

The NEC Versa 2200C has the following switches:



Reset — This recessed switch resets the system if the NEC Versa does not respond to keyboard input or VersaGlide movement. This is an alternative to powering down the system and restarting it. (Use a non-metallic pointed object.)

Power — Slide right to turn on; slide right again to turn off.

Power Management — Press the switch down to turn Power Management on; press again to turn it off.

Suspend/Resume — Press the switch down for Suspend mode; press again to resume active mode.

LEDs

The NEC Versa 2200C has several LED lights to let you know what's happening on your system.

Power Management — Green when On; no color when Off; blinking green when the system is in Suspend mode.

Battery/AC Power Status — There are several light indicators.

BATTERY STATUS	LED
AC Powered	Green
50% to 100% charged	Green
25% to 49% charged	Yellow
10% to 24% charged	Red
0% to 9% charged	Blinking Red
Charging	Blinking Green
Powered off	No color

Diskette — Green when the NEC Versa 2200C is writing data to or retrieving from the diskette in the diskette drive.

Hard Disk — Green when the NEC Versa is writing data to or retrieving from the system's hard disk.

Num Lock — Green is On; no color is Off.

Caps Lock — Green is On; no color is Off.

Scroll Lock — Green is On; no color is Off.

Keyboard

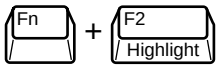
The NEC Versa 2200C keyboard is equipped with many features, including:

- Function keys
- Windows 95 keys (if applicable)
- Typewriter keys
- Cursor control keys
- Numeric keypad
- Control keys.

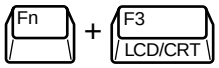
Function keys — The Fn (Function) key activates the functions printed in blue on keys having dual functions. Press and hold the **Fn** key and the desired function key simultaneously.

The applications that you run determine how these keys function. See the user's guides for the applications.

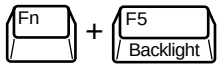
Function key combinations —



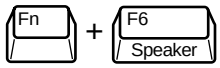
Highlight On/Off



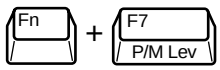
LCD/CRT/Both



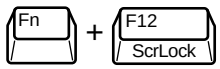
Backlight Low/High



Speaker Volume On/Off



Power Management (P/M) Longest Battery Life/Maximum Performance/Personal Setup/ Off



Scroll Lock On/Off

Windows 95 keys — With Windows 95, you can use the following two key combinations to facilitate your work.

— **Fn + x** – Quick access to shortcut menus

— **Fn + z** – Display the Start menu

Typewriter keys — The typewriter keys (also called alphanumeric keys) are used almost exactly as on a typewriter. Those that behave differently do so when combined with control keys or function keys.

Cursor control keys — Cursor control keys let you position the cursor on the screen wherever you want. On the screen, the cursor is a blinking underline, block, or pointer, depending on the application. It indicates where the next text typed will be inserted.

Numeric keypad — Pressing the **Num Lock** on the keyboard activates the numeric keypad when an external keyboard is not connected. The numeric keys are printed in blue. The keypad lets you type numbers and mathematical operands (+, -) as you would on a calculator. The keypad is ideal for entering long lists of numbers.

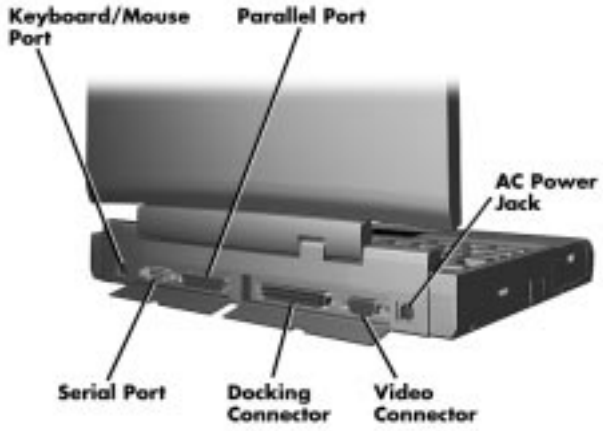
Control keys — Control keys include **Ctrl**, **Alt**, **Fn**, and **Shift**. They are used in conjunction with other keys to change their functions. To use these control keys, press and hold the **Ctrl** key while pressing another key. For example, "**press Ctrl c**" means to hold down the **Ctrl** key and type the letter **c.** How the key combination works depends on the applications you are running. Other control keys include **Num Lock**, **Scroll Lock**, **Ins, Del, Home, End, PgUp,** and **PgDn**.

NEC VersaGlide

This is the mechanism by which you control the pointer on the screen with your finger. It serves the same function as the mouse or trackball on other systems. For more information on the VersaGlide, see Chapter 2, "Learning to Use the Hardware."

Rear

The rear of the system has ports for connecting your NEC Versa 2200C to other devices, like a printer or an external mouse, and power sources.



Rear of system

Keyboard and Mouse Port — Use the standard PS/2 port to connect an external PS/2 mouse or an external PS/2 keyboard. If you want to connect both, use the optional NEC Versa Y Adapter. (See the online *NEC Versa 2200C Options Catalog*.)

Serial Port — Use this to connect an external modem or a serial printer. You can tell that it's serial by looking at the cable. A serial cable has a 9-pin connector.

Parallel Port — Use to connect a parallel printer, tape drive, or CD-ROM reader. A parallel device has a 25-pin cable connector.

Docking Connector — Use this connector to attach the NEC Versa 2200C to a MiniDock 2000 or MediaDock 2000 to further expand your options.

Video Port — Use this 15-pin connector port to attached an external CRT monitor to your NEC Versa 2200C. You can run both the LCD display and the external monitor simultaneously, or each alone.

AC Power Jack — Use the power jack to attach the NEC Versa 2200C to an AC power source such as the AC adapter or the optional car adapter.

Left Side

The left side of your NEC Versa 2200C has two slots for PC cards and a hard disk drive compartment. (There is also port cut-out on this side for the optional internal modem.)

Left side

PC Card Slots — PCMCIA is a standard interface for peripheral devices like fax/modems, local area network (LAN) cards, storage cards, and pagers. A PC card is about the size and shape of a credit card and inserts into one of the two slots.

Hard Disk Drive — The NEC Versa 2200C hard disk drive is removable. You can exchange hard disks in the NEC Versa 2200C.

Right Side

On the right side of the NEC Versa 2200C is a diskette drive and a compartment for the removable battery.

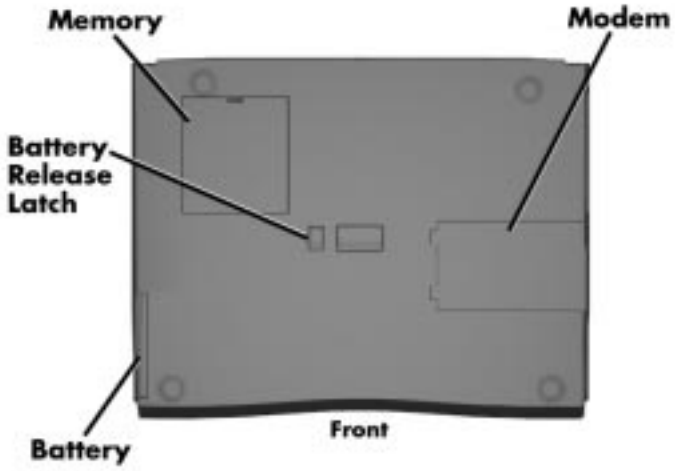
Right side

Diskette Drive — You can save your files to diskette and install software from diskette using the diskette drive, called drive A.

Battery — On the front side is the removable Lithium Ion (Li-Ion) battery.

Underside

Every inch of the NEC Versa 2200C has a purpose — even the underside! Turn your system upside down. You'll see three compartments. The small compartment is for expansion memory modules. Another compartment contains the Lithium Ion (Li-Ion) battery. There is also a compartment for an internal data/fax modem.



Bottom of system

NOTE There is a small compartment in the center of the underside that contains the CMOS battery. You should not attempt to remove this battery.

SYSTEM CARE

The NEC Versa 2200C is a durable, dependable system built for extensive use and travel. Follow these guidelines to maintain the condition and performance of your computer.

Precautions

Follow these precautions when using your NEC Versa 2200C and the AC adapter.

- Avoid dropping or bumping the computer or the AC adapter.
- Do not stack heavy objects on the computer.
- Avoid moving the NEC Versa 2200C during system operation, especially while the hard disk or diskette drive is being accessed.
- When using the AC adapter, make sure the power source falls within the system's compatible range of 100–240 volts AC. Never use the AC adapter if the voltage falls outside of this range. (Watch for this when traveling to foreign countries.)
- Turn computer power off before attaching or removing non-plug and play devices.
- Avoid using the computer or AC adapter for extended periods in direct sunlight.
- Do not use the system in humid or dusty environments.
- Avoid exposing the NEC Versa 2200C or AC adapter to extreme changes in temperature or humidity. If it is unavoidable, allow your NEC Versa to adjust to room temperature before using.
- When cleaning the system, use a soft, clean, dry cloth. Avoid wiping the display surface with abrasive material, including a rough cloth.

- The VersaGlide has a sealed surface that resists normal dust and moisture and should require nothing more than an occasional cleaning. To clean the VersaGlide, simply wipe it off with a clean cloth. For stubborn grime, use a lightly moistened (with water) cloth.

Storage Requirements

Store the computer and AC adapter in an environment that meets the following conditions:

- Maintain storage temperatures between –4°F and 104°F (–20°C and 40°C).
- Keep the storage area free from vibration and magnetic fields.
- Keep the system and its components away from organic solvents or corrosive gases.
- Avoid leaving the system and its components in direct sunlight or near heat sources.

Routine Cleaning

Clean or dust your system as follows.

- LCD screen — Carefully wipe the LCD screen with a soft cloth or a screen wipe designed for that purpose. Special screen wipes are available through your local computer dealer.
- System plastic — If the NEC Versa 2200C plastic case gets dirty, carefully wipe it with a slightly damp, almost dry cloth. Be extremely careful not to drip any moisture onto or into the NEC Versa 2200C. *Never* use harsh solutions or spray chemical cleaning products on the NEC Versa 2200C.

⚠ CAUTION

Never use household cleaning solvents that contain caustic materials. The use of these cleaners may cause cracking or discoloration of the plastic surface.

- VersaGlide — Wipe the pad surface with a clean cloth. For stubborn grime, use a lightly moistened (with water) cloth.

⚠ CAUTION

If the environmental temperature of the NEC Versa suddenly drops (for example, when you move the system from a warm place to a cold place), vapor condenses inside the system. Turning on the system under this condition can cause damage to the internal components. Wait before turning the system on so that the internal temperature of the system can equalize with the cooler environment and any moisture can dry.

2 Learning to Use the Hardware

Like any computer, the NEC Versa 2200C is made up of the hardware — the physical unit and its components — and the software — the programs that run on the computer. This chapter discusses the hardware. The topics include:

- Powering the system
- Keyboard
- NEC VersaGlide
- Options and PC Card Expansion

POWERING YOUR NEC VERSA

Since the NEC Versa 2200C is a truly portable computer, you can use it practically anywhere with any one of a number of power sources, including:

- the AC adapter connected to an electrical wall outlet (using AC power)
- the battery pack
- the optional DC adapter connected to a car cigarette lighter.

AC Adapter

Use the AC adapter that came with your NEC Versa 2200C to run your computer with AC (alternating current) power, or to recharge the battery pack. Use the AC adapter whenever a wall outlet is nearby.

Keep the adapter connected whenever possible. The AC adapter keeps the battery charged while you use the system and when the NEC Versa 2200C is powered off.

Here's how you connect the AC adapter:

1. Connect the AC adapter to your NEC Versa 2200C.

Connecting the AC adapter

2. Connect the end of the power cable to the AC adapter.

3. Connect the other end of the power cable to a 100- or 240-volt wall outlet.

Battery Pack

The NEC Versa 2200C comes with a rechargeable Lithium Ion (Li-Ion) battery. With it, you can run your system without a wall outlet for up to four hours with Power Management or two hours without Power Management. It's easy to install and remove.

You can keep track of the battery's status through the LED on the front of the system or with the battery gauge in Windows. Both let you know how much battery power you have left.

When your battery power is getting low, you can replace the battery with a charged Li-Ion battery while your system is off or in Suspend mode or leave the original battery in the system and simply plug in your NEC Versa 2200C AC adapter into a wall outlet. The battery recharges over a period of two hours while in the NEC Versa 2200C and the system is powered off. You can recharge the battery in six to seven hours while the system is on.

Optionally, you can buy a battery charger to quickly charge your battery. See the online *NEC Versa 2200C Options Catalog*.

Removing the Battery Pack

Use the following procedure to remove the battery pack.

1. Power off the NEC Versa 2200C and turn it over.
2. With the front of the system facing you, press on the battery compartment cover and slide it upward to remove it.
3. Locate the battery release latch on the bottom of the system. Slide the latch in the direction of the arrow. The battery pack pops out slightly.
4. Gently pull out the battery pack.

See the online *NEC Versa 2200C InfoCenter Basics* for a demonstration of this procedure.

⚠ WARNING

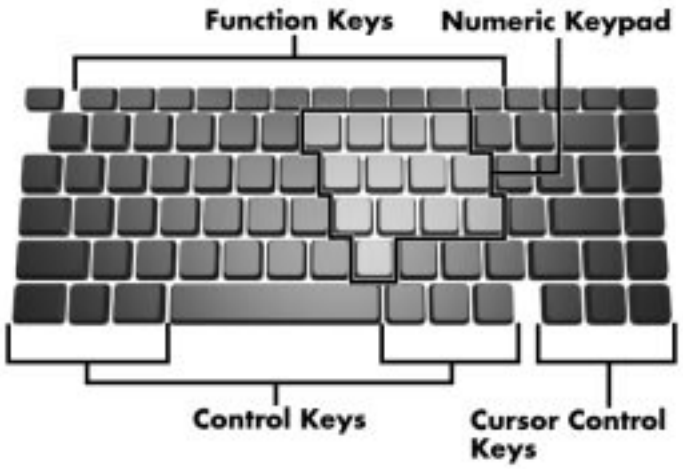
To prevent accidental battery ignition or explosion, adhere to the following:

- Keep the battery away from extreme heat.
- Keep metal objects away from the battery terminals to prevent causing a short circuit.
- Make sure the battery is properly installed in the battery bay.
- Read the precautions printed on the battery and in the online *NEC Versa 2200C InfoCenter Basics*.

KEYBOARD

The NEC Versa 2200C keyboard is equipped with many features. They include the following.

- Function keys
- Cursor control keys
- Typewriter keys
- Numeric keypad
- Control keys



Keyboard

Function keys — There are 12 function keys, **F1** through **F12**. The **Fn** key activates key functions printed in blue on keys having dual functions.

Cursor Control keys — Cursor control keys let you position the cursor on the screen where you want. On the screen, the cursor is a blinking underline or block, depending on the application. It indicates where the next text typed is inserted.

Typewriter keys — The typewriter keys (also called alphanumeric keys) are used to enter text and characters. Those keys that have blue printing on them behave differently when combined with control keys or Fn keys.

Numeric Keypad — Pressing **Num Lock** on the keyboard activates the numeric keypad (when an external keyboard is *not* connected). The keypad lets you type numbers and mathematical operands (+, –) as you would on a calculator. The keypad is ideal for entering long lists of numbers.

When you press **Num Lock** again, the keys revert to their normal functions as typewriter keys.

Control keys — **Ctrl**, **Alt**, **Fn**, **Ins**, and **Shift** are controls that are used in conjunction with other keys to change their functions. To use these control keys, press and hold the **Ctrl** key while pressing another key. For example, "press **Ctrl c**" means to hold down the **Ctrl** key and type the letter **c**. How the key combination works depends on the applications you are running.

THE NEC VERSAGLIDE

The NEC VersaGlide is an easy way to control the screen pointer (cursor) with your finger. Simply move your finger across the NEC VersaGlide touchpad and the cursor follows. You select an object on the screen in either of two ways:

- Double click the left button (this is the primary button)
- Double tap your finger on the VersaGlide touchpad.

Try both ways and decide which you prefer.

You can also reverse the primary (left) and secondary (right) buttons.

For details on using the NEC VersaGlide, see the online *NEC Versa 2200C InfoCenter Basics*

Personalized Modes

The NEC VersaGlide has four personalized modes that make finding the cursor on your screen quick and easy. Press the key sequence you've defined in NEC Mouse Shortcuts, and the cursor jumps to the spot on the screen you have preselected. See the Windows 95 Settings, Control Panel, Mouse.(Or in Windows for Workgroups, see Settings, Control Panel, NEC VersaGlide.)

Pointer Size, Speed

You can change the size, color, and speed of the pointer controlled by the NEC VersaGlide. See the Windows Control Panel, NEC VersaGlide, Pointer and Motion if you have Windows for Workgroups. If you have Windows 95, see Settings, Control Panel, Mouse.

Ergonomics

Follow these basic ergonomic tips while working:

- Use a light touch on the VersaGlide surface.
- Set up your NEC Versa 2200C with your keyboard and VersaGlide at a comfortable height. Keep your forearms parallel to the floor. Your wrists should be relaxed and straight.
- While using the keyboard and VersaGlide, keep your shoulders and arms as relaxed as possible.
- Take regular breaks from the computer to rest your eyes, and perform stretching exercises to relax your fingers, hand, wrists, forearms, and shoulders.

See Appendix A, “Setting Up a Healthy Work Environment,” for more information.

OPTIONS AND PC CARD EXPANSION

You can add a number of options and connect several external devices and PC cards to your NEC Versa 2200C. You can get details on how to obtain these options from the online *NEC Versa 2200C Options Catalog.*

Hard Disk

You can increase the system’s storage capacity by replacing the standard hard disk, or you can have two hard drives for alternate usage (for example, one for office use and one for home use). Here is how to replace the hard disk:

1. Check that the NEC Versa 2200C power is off.
2. Open the hard disk compartment cover, swing the drive handle down, and pull the drive out of the compartment.
3. Swing the handle on the new drive down. Install the drive, sliding it into the compartment. Press firmly to make sure the drive is fully inserted. Swing the drive handle up.

4. Close the disk compartment cover. Turn on system power.
5. Press **F1** to run Auto Setup to check the new configuration. Auto Setup recognizes the new drive if it's a different size from the first drive. Refer to "Auto Setup Utility" in Chapter 3 of this guide or to the online *Advanced Topics* for details on using Auto Setup.

Memory Expansion

Your NEC Versa 2200C comes standard with 8 megabytes (MB) of random access memory (RAM). You can increase system memory to a maximum of 40 MB by installing any one or combination of two of the following memory modules in the system.

- 4-MB memory card
- 8-MB memory card
- 16-MB memory card

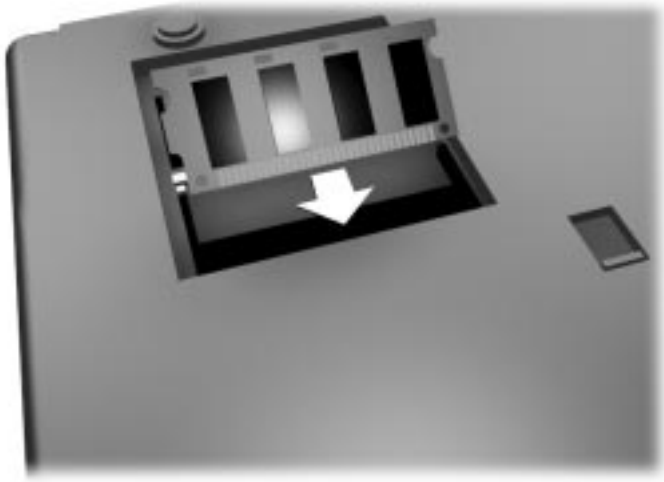
Use the following steps to install a memory card.

1. Make sure the system power is off.
2. Turn the NEC Versa 2200C upside down.
3. Remove the memory compartment cover from the system by releasing the small latch and lifting the cover off the system

Removing cover

4. Install the memory card as follows.

   - Align the memory card connector with the connectors in the system. (The card fits in either slot.)
   - Insert the card connector by sliding it into the system connector. Press the card to make sure it is securely seated.



Inserting an optional memory card

5. Replace the memory compartment cover.
6. Run Auto Setup to check the new configuration. Auto Setup should show a blinking arrow next to the extended memory field. The new value should reflect the increase in memory. (Refer to "Using Auto Setup" in the online *Advanced Topics*.) If it does not verify, make sure the memory card is properly seated in the slot.

External Monitor

You can add a standard external monitor to your NEC Versa 2200C. You need a display signal cable (usually provided with the monitor). One end of the cable must have a 15-pin connector for the system. (See the back of the NEC Versa 2200C, behind the right-rear cover, for the monitor connector.)

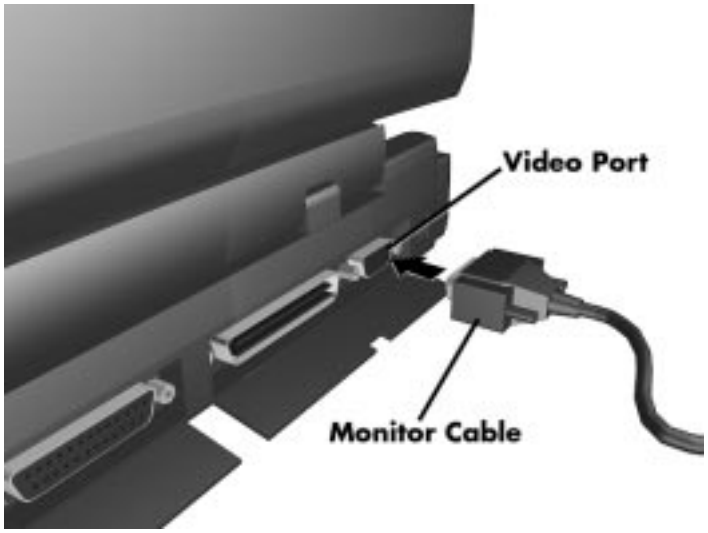
Follow these steps to connect an external monitor to your NEC Versa 2200C.

1. Check that the NEC Versa 2200C is in Suspend mode or powered off and the monitor power switch is turned off.

> NOTE The NEC Versa 2200C must be in Suspend mode or powered off while the monitor is being connected.

2. Open the right-rear cover of the system.
3. Attach the 15-pin cable connector to the video port on the system. (The video port is the second from the right.) Secure the cable connection with the screws provided.

2



Connecting a monitor

4. Connect the monitor power cable and plug it into a properly grounded wall outlet.
5. Follow any setup instructions in the monitor manual.
6. Turn on power to the monitor.
7. Press the Suspend button to resume Active mode or power on the NEC Versa 2200C.

Toggle the **Fn + F3** function key combination to select both the LCD and CRT monitor, CRT monitor only, or LCD only.

Printers

You can attach a printer with either a parallel or a serial connector. A parallel printer connector has 25 pins; a serial connector has 9 pins.

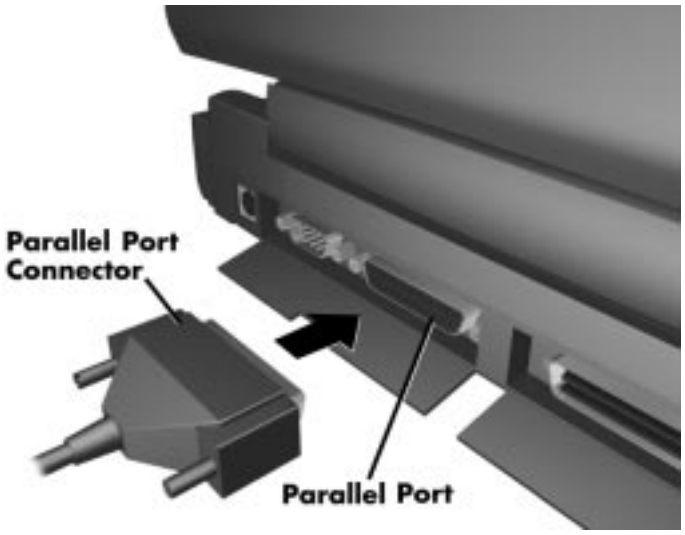
Parallel Devices

To install a parallel device (such as a printer, CD-ROM reader, or tape drive), you need a cable with a male 25-pin connector for the system and, for most parallel printers, a Centronics® compatible 36-pin connector.

> NOTE When you connect a printer, be sure you install the appropriate device driver through the Control Panel. See the online *Windows QuickStart Guide* or *Using Windows 95* for instructions on installing the device.

To connect a parallel device to your NEC Versa 2200C, do the following.

1. Check that both the NEC Versa 2200C and device power are off.
2. Open the left-rear cover of the system and locate the parallel port. (The parallel port is the third from the left.)
3. Align and connect the 25-pin printer cable connector to the parallel port on the system. Secure the cable with the screws provided.



Connecting a parallel device

4. Align and connect the other end of the cable to the parallel port on the device. Lock the connector clips.

5. Connect the power cable to the device and a properly grounded wall outlet.

6. Turn on power to the system and then to the device.

> NOTE Check that the device is online before you try to use it. See the instructions that came with your device for further information.

Serial Devices

To install a serial device such as a printer or an external modem, you need a cable with a female 9-pin connector.

> NOTE When you connect a printer, be sure you install the appropriate printer driver through the Windows Control Panel. See the online *Windows QuickStart Guide* or *Using Windows 95* for instructions on using the Control Panel.

Follow these steps to connect a serial device to your NEC Versa 2200C.

1. Check that both the NEC Versa 2200C and the device power are off.
2. Open the left-rear port cover and locate the serial port, (second from left).
3. Align and connect the 9-pin connector with the serial port on the system. Secure the connection with the screws provided.
4. Align and connect the other end of the cable to the appropriate port on the device. Secure the connections with the screws provided.
5. Connect the power cable to the device and a properly grounded wall outlet.
6. Turn on power to the system and then to the device.

> NOTE Make sure your device is online before trying to use it. See the device guide for instructions.

External Keyboard

You can add a full-size PS/2-style keyboard to your NEC Versa 2200C using the Plug and Play feature. You cannot use the system keyboard while an external keyboard is connected. However, when you press the numlock key combination (**Fn+NumLock**), the numeric keypad on the external keyboard only is enabled.

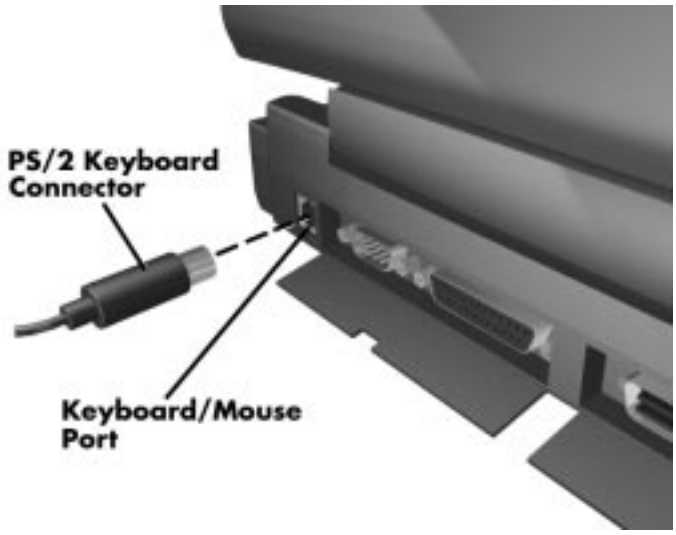
If you want to attach both an external keyboard and a PS/2-style external mouse at the same time, use the optional NEC Y-adapter. See the online *NEC Versa 2200C Options Catalog*.

Follow these steps to connect an external keyboard to your system.

1. Check that the NEC Versa 2200C is in Suspend mode or powered off.

> **⚠ CAUTION**
>
> Make sure the NEC Versa 2200C is in Suspend mode whenever you add or remove a keyboard. Doing so with the power on in Active mode may damage either the keyboard controller chip or the keyboard.

2. Connect the keyboard cable connector to the keyboard port on the system. (The keyboard/mouse port is the first one on the left rear of the system.)



Connecting an external keyboard

3. Press the **Suspend** button again to resume Active mode.

The system will immediately recognize the keyboard. After you connect an external keyboard, you can use only the external keyboard. The built-in system keyboard will become disabled.

NOTE For instructions on connecting an external keyboard to either the NEC Versa MediaDock 2000 or the MiniDock 2000, see the user's guide that came with your specific docking station.

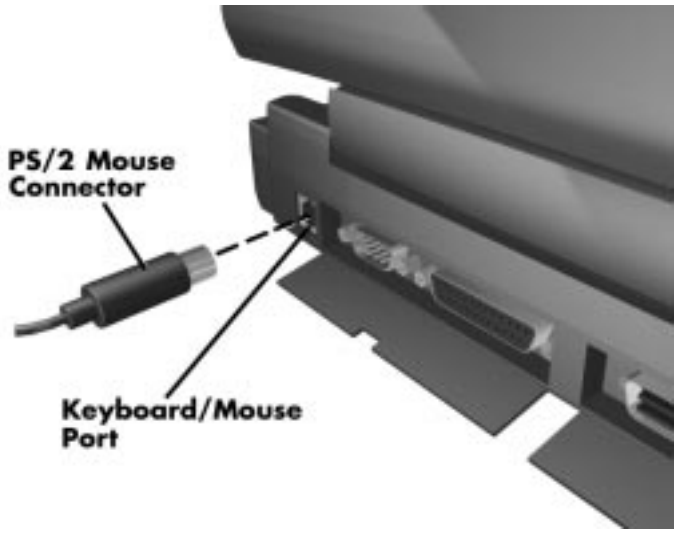
Mouse

You can add an external mouse to your NEC Versa 2200C to use in place of the NEC VersaGlide for moving the pointer. Use the following procedure to connect a PS/2-style mouse to the system.

1. Check that the NEC Versa 2200C is powered off.

> **⚠ CAUTION**
>
> Make sure the NEC Versa 2200C is powered off whenever you add or remove a mouse. Doing so with the power on may damage either the system or the mouse.

2. Connect the mouse cable connector to the keyboard/mouse port on the system. (The keyboard/mouse port is the first one on the left.)



Connecting an external mouse

3. Power on the NEC Versa 2200C again.

> NOTE For instructions on connecting an external mouse to either the NEC Versa MediaDock 2000 or MiniDock 2000, see the user's guide that came with your specific docking station.

Internal Modem

The NEC Versa 2200C comes ready for you to install an internal modem to send and receive faxes, cruise the Internet, and download information. A modem converts data so it can be transmitted over phone lines and then converts it back again so you can read it on your computer. You can purchase a 14.4 kbps fax/modem board as an option for your NEC Versa 2200C.

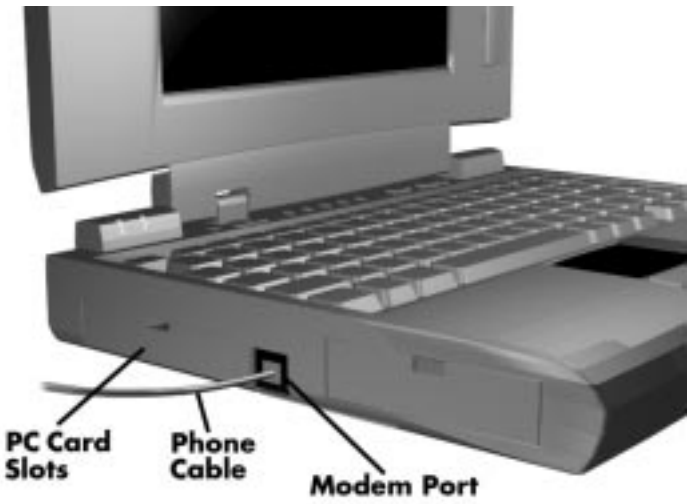
> NOTE Your NEC Versa 2200C does not have an internal modem, but you can purchase one as an option. Or you can use a PC card modem. See the online *NEC Versa 2200C Options Catalog* for both options.

Your NEC Versa 2200C comes with several online service gateways — all the basic software you need to communicate with the outside world.

Use the following procedure to connect a phone line to the NEC Versa 2200C.

1. Unplug the telephone cable from the telephone.

2. If you have an internal modem, plug the telephone cable into the modem connector on the NEC Versa 2200C. If you have an NEC Versa 2200C without an internal modem, plug the phone cable into the PC card which is inserted in a PCMCIA slot.



Connecting to the optional internal modem

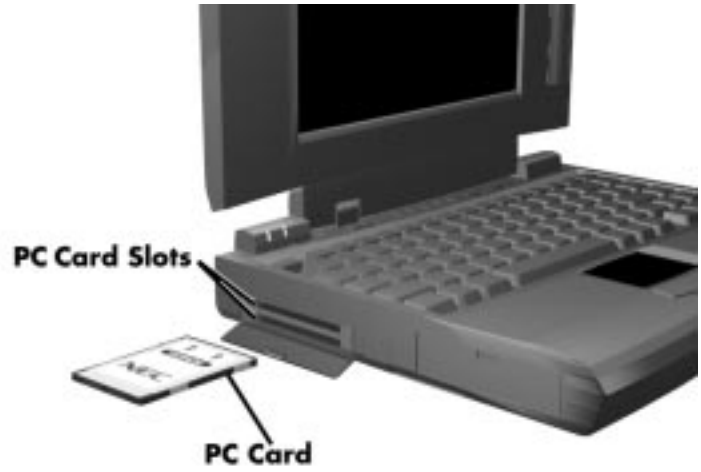
You are now ready to use your communication software to run an online service, or download the latest NEC Bulletin Board Services information.

PCMCIA (PC Card)

You can easily install and interchange peripheral devices, such as modems, SCSI, sound, LAN cards, and storage cards in your NEC Versa 2200C. The NEC Versa 2200C series notebook computers have software that automatically allocates system resources when you install or remove a PC card using PCMCIA technology. Refer to the user's guide that came with your PC card for any special information.

To insert a PC card, open the slot cover and follow these steps.

1. Align the card so the 68-pin connector points toward the slot.
2. Slide the card into either slot. A low, then high tone lets you know that it's fully inserted and recognized. (If you turned off the sound on the Versa, the tones do not sound.) Other two-tone sequences such as high, then low tones indicate the card is inserted, but the type is unknown.



Inserting a PC card

3. If your system is running Windows for Workgroups, look for the CardWizard™ icon in the Windows Porgram Manager. It shows which slot contains a PC card and which is empty.(You can get the same information if you're running Windows 95 through Settings, Control Panel, and the PC Card icon.)

4. To remove the card, press the button on the side of the slot. You'll hear another double tone. (In Windows 95, double click on the PC card icon on the task bar. Select the PC card to be removed, and click on **Stop**. When you get a prompt, click **OK**, then press the button on the side of the slot and remove the card.)

NEC Versa MediaDock 2000

The NEC Versa 2200C expansion options give you one touch connection to external peripherals or a full-blown multimedia station. The MediaDock 2000 provides CD-ROM capability and a stereo sound system. See the *NEC Versa MediaDock 2000 User's Guide* for instructions on connecting the docking station.

NEC Versa 2200C docked with a MediaDock 2000

NEC Versa MiniDock 2000

The NEC Versa MiniDock 2000 option provides you with the convenience of a dock at your desk without taking up a lot of space. With your NEC Versa 2200C securely attached to the MiniDock, you can have one connection with all your peripheral resources — printer, local area network, monitor, mouse, and keyboard — instead of five separate connections. The NEC MiniDock 2000 also provides two additional PCMCIA slots.

NEC Versa 2200C docked with a MiniDock 2000

3 About the Software

This chapter introduces you to the software that comes with the NEC Versa 2200C, including:

- Windows 95 or Windows for Workgroups
- MS-DOS®
- Online Help
- NEC Utilities

WINDOWS INTRODUCTION

Your NEC Versa 2200C gives you the option of loading either Windows 95 or Windows for Workgroups to use on your system. Both Microsoft operating systems provide a means of running applications, navigating through your file structure, and using your notebook computer. Each operating system offers its own look and means of operation.

Both Windows 95 and Windows for Workgroups use a graphical interface to make the operating systems easy to use.

Most popular programs today are designed specifically for Windows, using menus and dialog boxes that operate in much the same way. Learning one program, therefore, helps you learn other Windows programs.

Windows 95

Windows 95 gives you the newest features offered by Microsoft, including a Desktop with room to maneuver, a Taskbar for quick navigation between open windows, plug and play features, networking functions, and more.

When you choose to install Windows 95, the following icons are loaded on your desktop:

- My Computer — provides access to drives, printers, the Control Panel, and network features.
- Inbox — lets you access the Microsoft Fax and Mail software as well as Microsoft Network Services.
- The Internet — lets you set up a connection via a modem or network PC card to the Internet.
- Microsoft Network — lets you access the Microsoft Network online service if you have a modem.
- Recycle Bin — gives you a trash container in which to put unwanted files.
- Network Neighborhood — shows you the network, integrated LANs, and WANs if your system is connected to a network.
- My Briefcase — gives you quick access to files you frequently use.
- NEC Versa 2200C InfoCenter — provides several levels of information about your NEC Versa 2200C. (This is further described later in this section.)
- Start — lets you access a pop-up menu to start programs and applications, open documents, and shut down your system.

See the online *Using Windows 95* for instructions on using Windows 95.

Windows for Workgroups

Windows for Workgroups offers the Windows interface to which experienced users are accustomed. The Program Manager contains the following program groups.

- Main — Includes programs and tools to help you control printing; set up printers, plotters, and modems; customize the desktop; and manage files.
- Microsoft Accessories — Includes desktop programs that come with Windows, such as a simple word processing program, a drawing program, a calendar, and a calculator.
- Startup — Lets you add programs to start automatically when you start Windows.
- Games — Gives you a means to practice your Versa-Glide skills or just relax.
- My Office — Includes any applications that Windows detects on your hard disk during installation.
- NEC Versa 2200C InfoCenter — Includes online topics specific to the NEC Versa, NEC customer support, and Windows and DOS.
- NEC Versa 2200C Utilities — Includes small programs written by NEC to help you manage your NEC Versa computer.

Every application in Windows is assigned an icon. Application icons are placed in group windows, which are represented by group icons. To start an application, highlight and double click or double tap the application icon.

See the online *Windows QuickStart* in the NEC Information program group for detailed instructions on using Windows for Workgroups.

DOS INTRODUCTION

MS-DOS is the Microsoft disk operating system that runs the computer. DOS uses commands that every personal computer user needs to know at least a little about. The Windows environment makes it possible for you to manage your system and application programs without knowing DOS commands, but as you become more comfortable with computers you may want to begin learning DOS.

For detailed instructions on how to use MS-DOS, refer to the online book *MS-DOS 6.22 QuickStart* in the NEC Versa 2200C InfoCenter program group. (This is available if you have Windows for Workgroups on your computer.)

GUIDE TO ONLINE HELP

The NEC Versa 2200C has plenty of information for you online.

NEC Versa 2200C InfoCenter

The NEC Versa 2200C InfoCenter contains several specific areas of information to help you.

System Tour 

The NEC Versa 2200C *System Tour* takes you completely around the computer, pointing out components, switches, software, and utilities. It's intended to get you comfortable with your new notebook computer. The Tour takes about five minutes.

Basics 

Basics describes the NEC Versa 2200C main features, how to travel with the system, use power management, and care for the system. It includes a glossary.

Advanced Topics 

Advanced Topics covers more specific areas such as adding options, changing setup options, and solving problems. It also includes a glossary.

Questions and Answers 

Questions and Answers provides frequently asked questions and their answers about notebook computers to help you solve common problems yourself.

Additional Topics

NEC Versa 2200C Series Options Catalog 

The NEC Versa 2200C Series *Options Catalog* lists options such as memory cards, hard drives, carrying cases, and PC cards that you can purchase for the NEC Versa 2200C.

Customer Service Guide 

The *NEC Customer Service Guide* discusses the various levels of support NEC offers you, our customer. We provide lots of information to help you become self-sufficient with your NEC Versa 2200C, but if you need help, we're there for you.

UltraCare Guide 

The *NEC UltraCare Guide* describes NEC's one-year warranty program to help you protect your investment in an NEC Versa 2200C Series computer.

The Windows QuickStart Guide 

This online "book" provides a series of lessons on using Microsoft Windows for Workgroups on the NEC Versa 2200C.

Using Windows 95 

This online "book" provides a series of lessons on using Microsoft Windows 95 on the NEC Versa 2200C.

The MS-DOS 6.2 QuickStart Guide 

This online "book" presents a series of lessons on using MS-DOS, which also runs on the NEC Versa 2200C. This appears on Windows for Workgroups only.

GUIDE TO NEC UTILITIES

NEC provides several programs and routines designed to make your NEC Versa 2200C run more efficiently. These programs are known as utilities. You can access most of these utilities from Windows.

Distribution Diskette Creator 

This utility lets you create distribution diskettes for the system contents. Use the distribution diskettes to make a backup copy of the programs that came on your NEC Versa 2200C. Save the diskettes in case you need software to re-load. Windows for Workgroups and Windows 95 operating system backup diskettes are available through NEC Backup Disk Fulfillment at 1-800-842-6446.

PowerCenter 

This utility lets you select the specific Power Management you want.

Preference Tools Utility 

This utility displays your preferred system settings such as screen backlight on/off and other settings.

NEC Battery Gauge 

This utility periodically checks on your battery status. The gauge shows you the percentage of power left in your Li-Ion battery.

NEC Backup 

This utility allows you to back up to diskette the entire contents of your system. You'll need a large number of diskettes for this. This utility is used on Windows for Workgroups only.

PHDisk

This utility creates a file on the hard disk that is large enough to contain all the software in memory. Its default size is approximately 16-MB. You will need to update this utility only if you upgrade the amount of memory to more than 16-MB in your NEC Versa 2200C. This utility must be run in DOS. (It will not run on a compressed drive.)

Auto Setup Utility

Auto Setup automatically configures your NEC Versa 2200C each time you start it up. This utility also lets you change your system start-up settings.

Using Auto Setup

Use Auto Setup as follows:

1. Reboot your system. When the screen displays the blinking block at boot-up, press **F1**.
2. When the Auto Setup Summary screen is displayed, enter the highlighted letter in the menu bar that represents the category you want.

   For example, type **D** to open the Disk Drive Settings window.
3. Use the up and down arrows to move between selections displayed on the screen. Press **Alt** + the arrow keys to display setting options.
4. Follow the instructions at the bottom of the screen to make selections, change values, and exit.

> NOTE Be sure to keep track of any password you enter. If you set a system password, a key icon appears at bootup. You must enter the password to access the system. To change the password, enter the password followed by a forward slash (/) and a new password. To remove the password, enter the password followed by a forward slash (/).

Refer to the online *Advanced Topics* for details on Auto Setup.

4 Traveling with Your NEC Versa 2200C

The NEC Versa 2200C makes a natural traveling companion. Using a battery, you can use the computer anywhere you go. Here is some information you might find helpful when taking the NEC Versa on the road.

- Carry an extra charged battery pack for additional battery power.
- Check that you have everything you need before you leave on a trip. Be sure you have all the necessary cables and accessories. (See the checklist at the end of this chapter.)
- If you run your system with battery power, maximize battery life by using power-saving features whenever possible.
- Take the AC adapter in case you have an electrical outlet handy. This saves battery power for when you really need it.
- Carry any application or data files on diskette that you might need.

TIP: Speed the trip through airport security by carrying a charged system. Inspectors want to see the screen display a message. The boot message is usually sufficient.

If your system is fully charged, the inspection only takes a minute or so. Otherwise, be prepared to attach the AC adapter and power cable. If you don't have these, the inspection might include a disassembly of the system.

POWER CONNECTIONS

With the right accessories, you can run your NEC Versa 2200C almost anywhere! Your system self-adjusts to various power sources. The United States, Canada, and most of Central and South America use 110-volt alternating current (AC). Most other countries of the world use 220-volt AC. The NEC Versa 2200C adapts to voltages ranging from 100 to 240 volts.

There are a few countries with areas that use direct current (DC) as their main power source. You need a DC-to-AC converter in particular areas of Argentina, Brazil, India, Madeira, and South Africa.

To use your system overseas, you need an adapter plug and transformer. There are five different plugs available worldwide. You can buy these at an electronics supply store.

TIP: When using a modem outside the U.S. and Canada, you might need an international telephone adapter. You can buy this at an electronics supply store.

For more information on using the modem, see Chapter 2, "Learning to Use the Hardware" and Appendix C, “Modem Commands, Codes, and Registers” in this guide.

CHECKLISTS

The following checklists can help you prepare for your trip with your NEC Versa 2200C. Look them over and use what fits your situation.

What to Take

The following are what you should take with you when you travel with your NEC Versa 2200C.

- At least two fully charged batteries
- Single-outlet surge protector
- Long telephone extension cord with RJ-11 plugs
- Appropriate AC plug adapter
- Copy of proof of purchase for computer and other equipment for customs check
- Customer support phone numbers for your software
- *NEC Versa 2200C Series Quick Reference*
- A modem for networking (either an optional internal 14.4kbps modem or a PC card modem.)
- AC extension cord.

Things to Do

Here is what you should do before you leave home:

- Back up your NEC Versa 2200C's hard disk.
- Put your system into Suspend or Standby mode so you can quickly boot up at the airport security check.
- Fully charge all your batteries.
- Tape your business card to your NEC Versa 2200C, AC adapter, and batteries.

5 Solving Problems

Once in a while you may encounter a problem with your NEC Versa 2200C. The NEC InfoCenter has *Questions and Answers* that might be helpful to you.

If the screen is blank, the instructions don't help, or no error message appears, use the information here to determine and fix the problem. You still may be able to solve the problem yourself!

PROBLEM CHECKLIST

First check the items in the following list. If these items don't help, see the table that follows the list.

- Power is on to the computer.
- The electrical outlet to which your AC adapter is connected is working. Test the outlet by plugging in a lamp or other electrical device.
- All cables are tightly connected.
- The display setting is configured correctly.
- The display's brightness control is adjusted properly.
- If using battery power, check that the battery pack is properly inserted and fully charged.
- If using the optional internal modem, check that it is properly inserted.

Troubleshooting

PROBLEM	WHAT TO DO
The system does not power on	If you are operating the system with battery power, check that the battery pack is correctly inserted. Attach the AC adapter to recharge the battery. If you have the AC adapter attached, check that the electrical outlet you are using works.
LCD screen is dark and blank	Power-saving mode may have shut off the backlight. Press any key, **Fn+F5**, or use the **suspend** button. The built-in LCD may not be selected. Press **Fn+F3** once or twice. Brightness control may need adjustment. Adjust the control. The system entered Suspend mode due to low battery power. Press the **suspend** button to resume operation. If the system does not resume, plug in the AC adapter or replace the battery pack, and try pressing the **suspend** button again.
Battery power does not last long	Use power-saving modes.
Information on the LCD screen is difficult to see	Adjust the brightness control.
An optional component does not work	Make sure the component is securely installed or connected. Verify that the system parameter for the I/O port configuration is set correctly in Auto Setup.

PROBLEM	WHAT TO DO
The power management button does not work	Check that Power management isn't set to off on the Preference toolbar. Power management may be disabled in Auto Setup. A disk drive might be busy. Wait until the disk drive stops and try again. The docking station might be connected to the NEC Versa 2200C. Some power management functions do not work when the docking station is connected.

START-UP PROBLEMS

The system displays an invalid configuration error message at power on when there are the following conditions:

- current configuration information doesn't match configuration information stored in Auto Setup, such as when an internal option is added or changed.
- the system loses configuration information.

If either of these conditions is true, the system displays an "invalid configuration information" message.

To continue start-up procedures, press **F1** and run Auto Setup to set current system parameters.

If an error message appears before the operating system starts, look up the error message in the following table. Follow the instructions. If you see other error messages, the hardware might need repair.

NOTE When the NEC Versa 2200C detects an error related to display devices, it cannot display on either the LCD or a CRT. The system warns you with a beep.

POST Error Messages

The NEC Versa 2200C has a built-in checking program that automatically tests its components when you turn the system power on. This diagnostic test is called the Power-On Self-Test (POST). If the system finds a problem during the POST, the system displays an error message. If this happens, follow the instructions in the POST error message table.

POST Error Messages

MESSAGE	WHAT TO DO
Diskette drive A failure	Drive A does not work or the diskette is not properly inserted. Drive A is the diskette drive. Press **F1** to start Auto Setup to check the diskette drive parameters. If there's still a problem, drive A might need repair.
Diskette read failure – press **F1** to run Auto Setup. Press any other key to retry boot	Remove the diskette from drive A and press **F1** to enter Auto Setup to confirm that the diskette drive is configured properly or press any other key to start the system from the hard disk. Or, insert a bootable disk in drive A and press any key to start the system from the diskette.
Non-system disk or disk error; replace and press any key when ready	Remove the diskette from drive A and press any key to start the system from the hard disk. Or, insert a bootable diskette in drive A and press any key.

POST Error Messages

MESSAGE	WHAT TO DO
No boot device available – press **F1** to run Auto Setup	Press **F1** to start Auto Setup. Change the hard disk type to the correct setting. Exit and save Auto Setup. Or, check to see that the hard disk is properly installed.
Invalid configuration information – run Setup program	One or more system configuration parameters are not properly set. Press **F1** to start Auto Setup, set them correctly, exit, and save to update the parameters.
Real time clock failure	Set time and date using Auto Setup. Exit and save to update the parameters.
Time-of-day not set – run Setup program	Set the time and date using Auto Setup. Exit and save to update the parameters.
Fixed disk configuration error	Start Auto Setup. Exit and save to update the parameters. Turn off the system and check to see if the hard disk is inserted properly. Insert a bootable diskette in drive A and press **Ctrl+Alt+Del** to start the system from diskette. If the system only boots from diskette, the hard disk might need repair.
Fixed disk failure	Press **F1** to start Auto Setup. Exit and save to update the parameters. Turn off the system and check to see if the hard disk is inserted properly. If the system only boots from diskette, the hard disk might need repair.

POST Error Messages

MESSAGE	WHAT TO DO
Fixed disk controller failure	Press **F1** to start Auto Setup. Exit and save to update the parameters. Turn off the system and check to see if the hard disk is installed properly. The hard disk controller may not work and might need repair.
Keyboard clock line failure	Unplug the external keyboard, if attached. Have the external keyboard repaired.
Keyboard data line failure	Unplug the external keyboard, if attached. Have the external keyboard repaired.
Keyboard controller failure	Unplug the external keyboard, if attached, and reboot the system. If it still fails, have the external keyboard repaired. **NOTE:** *Repeated keystrokes during boot may produce an error message.*
Keyboard stuck key failure	A key is jammed. Remove any obstruction you find. You may have repeatedly pressed the **F1** key when trying to enter Auto Setup. If the error message remains, you may have to have the keyboard repaired.

IF YOU NEED ASSISTANCE

If you have a problem with your computer, first review the checklist and troubleshooting table in the previous section.

If you still have a problem, call the NEC Technical Support Center (TSC), toll free, at 1-800-632-4525 Direct technical assistance is available 24 hours a day, seven days a week.

6 Getting Help

NEC is ready and willing to help you with our products. Here's how to reach us.

NEC Versa Diskette Fulfillment Center (800) 842-6446

To purchase backup diskettes and manuals.

NEC Customer Service and Support (800) 632-4525
Fax (508) 635-4666

Spare parts ordering, warranty claims, repair services, technical support, and service authorizations.

NEC FastFacts (800) 366-0476 (U.S and Canada)
(708) 238-7800 (International)

Automated fax service that offers product brochures, installation procedures, quick reference guides, promotional forms, troubleshooting information, and more.

NEC Electronic Bulletin Board (508) 635-4706

Remote database system containing files that are dedicated to enhancing the functions of NEC products. It also gives the general public access to drivers for NEC products to be used with various software applications.

CompuServe Password: "GO NECTECH"

Internet Address: tech-support@NECTECH.com

America Online: nectech

Worldwide Web Address: www.nec.com

NEC is a member of TSANet (Technical Support Alliance Network).

A Setting Up a Healthy Work Environment

⚠ WARNING

Prolonged or improper use of a computer workstation may pose a risk of serious injury. To reduce your risk of injury, set up and use your computer in the manner described in this appendix.

Contact a doctor if you experience pain, tenderness, swelling, burning, cramping, stiffness, throbbing, weakness, soreness, tingling and/or numbness in the hands, wrists, arms, shoulders, neck, back, and/or legs.

MAKING YOUR COMPUTER WORK FOR YOU

Computers are everywhere. More and more people sit at computers for longer periods of time. This appendix explains how to set up your computer to fit your physical needs. This information is based on ergonomics — the science of making the workplace fit the needs of the worker.

Some nerve, tendon, and muscle disorders (*musculoskeletal disorders*) may be associated with repetitive activities, improper work environments, and incorrect work habits. Examples of musculoskeletal disorders that may be associated with certain forms of repetitive activities include: carpal tunnel syndrome, tendinitis, tenosynovitis, de Quervain's tenosynovitis, and trigger finger, as well as other nerve, tendon, and muscle disorders.

Although some studies have shown an association between increasing hours of keyboard use and the development of some musculoskeletal disorders, it is still unclear whether working at a computer causes such disorders. Some doctors believe that using the keyboard and mouse may aggravate existing musculoskeletal disorders.

Some people are more susceptible to developing these disorders due to pre-existing conditions or psychosocial factors (see "Pre-existing Conditions and Psychosocial Factors" later in the appendix).

To reduce your risk of developing these disorders, follow the instructions in this appendix. If you experience discomfort while working at your computer or afterwards, even at night, contact a doctor as soon as possible. Signs of discomfort might include pain, tenderness, swelling, burning, cramping, stiffness, throbbing, weakness, soreness, tingling and/or numbness in the hands, wrists, arms, shoulders, neck, back, and/or legs.

NOTE To increase your comfort and safety when using your notebook computer as your primary computer system at your home or office, note the following recommendations:

- use a separate, external keyboard attached to your notebook computer
- use a separate, external monitor attached to your notebook computer.

ARRANGE YOUR EQUIPMENT

Arrange your equipment so that you can work in a natural and relaxed position. Place items that you use frequently within easy reach. Adjust your workstation setup to the proper height (as described in this appendix) by lowering the table or stand that holds your computer equipment or raising the seat height of your chair. Position your notebook computer directly in front of you for increased safety and comfort.

ADJUST YOUR CHAIR

Your chair should be adjustable and stable. Vary your posture throughout the day.

Check the following:

- Keep your body in a relaxed yet upright position. The backrest of your chair should support the inward curve of your back.
- Use the entire seat and backrest to support your body. Tilt the backrest slightly backwards. The angle formed by your thighs and back should be 90° or more.
- Your seat depth should allow your lower back to comfortably contact the backrest. Make sure that the backs of your lower legs do not press against the front of the chair.
- Extend your lower legs slightly so that the angle between your thighs and lower legs is 90° or more.
- Place your feet flat on the floor. Only use a footrest when attempts to adjust your chair and workstation fail to keep your feet flat.
- Be sure that you have adequate clearance between the top of your thighs and the underside of your workstation.

- Use armrests or forearm supports to support your forearms. If adjustable, the armrests or forearm supports should initially be lowered while all the other adjustments discussed in this appendix are made. Once all these adjustments are completed, raise the armrests or adjust the forearm supports until they touch the forearms and allow the shoulder muscles to relax.

ADJUST YOUR INPUT DEVICES

Note the following points when positioning your notebook computer or any external input devices.

- Position your keyboard directly in front of you. Avoid reaching when using your keyboard or mouse.
- If you use a mouse, position it at the same height as the keyboard and next to the keyboard. Keep your wrists straight and use your entire arm when moving a mouse. Do not grasp the mouse tightly. Grasp the mouse lightly and loosely.
- Adjust the keyboard height so that your elbows are near your body and your forearms are parallel to the floor, with your forearms resting on either armrests or forearm supports, in the manner described previously. If you do not have armrests or forearm supports, your upper arms should hang comfortably at your sides.
- Adjust the keyboard slope so that your wrists are straight while you are typing.
- Type with your hands and wrists floating above the keyboard. Use a wrist pad only to rest your wrists between typing. Avoid resting your wrists on sharp edges.
- Type with your wrists straight. Instead of twisting your wrists sideways to press hard-to-reach keys, move your whole arm. Keep from bending your wrists, hands, or fingers sideways.

- Press the keys gently; do not bang them. Keep your shoulders, arms, hands, and fingers relaxed.

ADJUST YOUR SCREEN OR MONITOR

Correct placement and adjustment of the screen or external monitor can reduce eye, shoulder, and neck fatigue. Check the following when you position the screen or external monitor.

- Adjust the height of your screen or external monitor so that the top of the screen is at or slightly below eye level. Your eyes should look slightly downward when viewing the middle of the screen or external monitor.
- Position your screen or external monitor no closer than 12 inches and no further away than 28 inches from your eyes. The optimal distance is between 14 and 18 inches.
- Rest your eyes periodically by focusing on an object at least 20 feet away. Blink often.
- Position the screen or external monitor at a 90° angle to windows and other light sources to minimize glare and reflections. Adjust the monitor tilt so that ceiling lights do not reflect on your screen or external monitor.
- If reflected light makes it hard for you to see your screen or external monitor, use an anti-glare filter.
- Clean your screen or external monitor regularly. Use a lint-free, non-abrasive cloth and a non-alcohol, neutral, non-abrasive cleaning solution or glass cleaner to minimize dust.
- Adjust the screen or external monitor's brightness and contrast controls to enhance readability.
- Use a document holder placed close to the screen or external monitor.

- Position whatever you are looking at most of the time (the screen or reference material) directly in front of you to minimize turning your head while you are typing.
- Get regular eye check-ups.

VARY YOUR WORKDAY

If you use your computer for prolonged periods, follow these instructions.

- Vary your tasks throughout the day.
- Take frequent short breaks that involve walking, standing, and stretching. During these breaks, stretch muscles and joints that were in one position for an extended period of time. Relax muscles and joints that were active.
- Use a timer or reminder software to remind you to take breaks.
- To enhance blood circulation, alter your sitting posture periodically and keep your hands and wrists warm.

> NOTE For more information on workstation setup, see the American National Standard for Human Factors Engineering of Visual Display Terminal Workstations. ANSI/HFS Standard No. 100-1988. The Human Factors Society, Inc., P.O. Box 1369, Santa Monica, California 90406

PRE-EXISTING CONDITIONS AND PSYCHOSOCIAL FACTORS

Pre-existing conditions that may cause or make some people more susceptible to musculoskeletal disorders include the following: hereditary factors, vascular disorders, obesity, nutritional deficiencies (e.g., Vitamin B deficiency), endocrine disorders (e.g., diabetes), hormonal imbalances, connective tissue disorders (e.g., arthritis), prior trauma (to the hands, wrists, arms, shoulders, neck, back, or legs), prior musculoskeletal disorders, aging, fluid retention due to pregnancy, poor physical conditioning and dietary habits, and other conditions.

Psychosocial factors associated with these disorders include: workplace stress, poor job satisfaction, lack of support by management, and/or lack of control over one's work.

Contact a doctor if you experience pain, tenderness, swelling, burning, cramping, stiffness, throbbing, weakness, soreness, tingling and/or numbness in the hands, wrists, arms, shoulders, neck, back, and/or legs.

This appendix was prepared in consultation with Dr. David Rempel of the University of California/San Francisco Ergonomics Program and Mr. M.F. Schneider of HUMANTECH, Inc., Ann Arbor, Michigan.

B Specifications and Environment

The following specifications are standard except where noted.

System Processor

Intel P54LM-75MHz

Random Access Memory (RAM)

Standard Main Memory — 8-MB high-speed interleaved access

Expansion (optional) — Two slots for DIMM sockets. Expandable in 4-MB, 8-MB, 16-MB increments up to a total of 40MB.

Video RAM — 1 MB

Cache RAM — L1: 8-KB code, 8-KB data

Read-only Memory (ROM)

256-KB x 8 bit, Flash ROM

Calendar Clock

Year/month/day/hour/minute/second maintained by internal back-up battery

Input/Output (I/O) Facilities

Integrated industry-standard interfaces

- Parallel — 1 port, 25-pin D-sub
- Serial — 1 port, 9-pin D-sub
- VGA — 1 port, 15-pin high-density D-sub
  32bit Local Bus
  Hardware Windows Acceleration

- External Keyboard/External Mouse — 1 port, PS/2, 6-pin MiniDin; exclusionary use
- Expansion — 1 port, VGA CRT signal, external keyboard signal, PS/2 mouse signal
- Phone — 1 port, RJ11 (when an internal modem is installed)
- Power — 3-pin Mini Jack

Card Slots

Two slots for two Type I/Type II PCMCIA cards or one Type III PCMCIA card. 3.3V interface.

Internal Fax/Modem

Ready to accept an optional NEC (Sierra Chip Set) 14.4Kbps v32 bis Fax/Modem with RJ11connector. See Appendix C for common modem commands.

Display

LCD

- 9.5-inch Thin-film transistor (TFT) CCFT backlit color
  Resolution — 640 x 480 pixels
- Dot Pitch — 0.3 mm
- Colors — 4,096 (64K colors on external CRT with video subsystem)
- Viewing Area — 9.5 in. diagonal
- Aspect Ratio — 4:3 (or true CRT aspect ratio)

Keyboard

Membrane Ultra Low Profile 83 keys with standard QWERTY-key layout (79 keys for International**)**

- Function keys — 12 keys
- Cursor Control keys — 8 keys; arrow keys arranged in inverted T layout

- Numeric keypad — embedded
- Fn key — function key for ROM-based key functions (5 keys for the Versa 2200) (2 additional function keys for Windows 95)
- Stroke — 3 mm

Diskette Drive

Standard 1.44-MB drive

- Size — 3.5 inch
- Capacity — 720 KB or 1.44 MB
- Access Time (average) — 94 ms
- Transfer Rate — 250 to 500K bps
- Interleave 1:1
- Controller — NS PC87334VJG

Hard Disk Drive

Internal 2.5-inch, 810-MB or 1-GB drive, removable

- Track-to-track seek rate — 4ms
- Average seek — 13ms (read), 14ms (write)
- Revolutions per minute — 4000
- I/F data rate — Mode 3-11 MB per second
- Media data rates — 39.5 – 27 Mbps
- 1579 cylinders x 16 heads x 63 sectors per track

Power

AC Adapter

- Input Voltage — 100 to 240 volts (V) AC, 50 or 60 Hz, 1.5 A maximum
- Output Voltage — 19 V DC, 2200mA (42W)

Battery Pack

- Type — Lithium Ion (Li-Ion)
- Output Voltage — 14.4 V
- Capacity — 2,700 mA
- Battery Life — Power Management off: 2 - 4 hours
  Power Management on: 3 - 4 hours

— Recharging Time

Approximately 2 hours when the system is off (Quick Charge)

Approximately 6 to 7 hours when the system is on (Normal Charge)

— Bridge Battery

Fully charged, backs up memory contents and system status for up to 30 minutes under Suspend mode, but battery change time is under 5 minutes.

Charge time: 24 hours.

Dimensions

System Unit

- Width — 11.8 in. (302 mm)
- Depth — 9.4 in. (241mm)
- Height — 2.1 in. (53.8 mm)

Battery Pack

- Width — 4.2 in. (108 mm)
- Depth — 4.5 in. (114.5 mm)
- Height — 0.85 in. (21.8 mm)

Weight

System — 6.51 lb (2.95 kg)

Battery Pack — 1.16 lb (527.6 kg)

Recommended Environment

Operation

- Temperature — 41°F to 95 F (5 C to 35 C)
- Relative Humidity — 20% to 80% (Noncondensing)

Storage

- Temperature — -4°F to 104°F (-20°C to 40°C)
- Relative Humidity — 20% to 80% (Noncondensing)

Memory Map

The system supports system miser and video shadowing. The system supports BIOS as a cacheable area with write protection. The following table shows the system's memory map.

MEMORY SPACE	SIZE	FUNCTION
00000h-9FFFFh	640 KB	Base Memory
A0000h-AFFFFh	64KB	Video Memory (graphics)
B0000h-B7FFFh	32KB	Upper Memory Block (UMB)
B8000h-BFFFFh	32KB	Video Memory (text)
C0000h-C9FFFh	40KB	Video BIOS
CA000h-CFFFFh	24KB	Available UMB
D0000h-DFFFFh	64KB	PCMCIA (in Windows for Workgroups Available UMB in Windows 95
E0000h-E7FFFh	32KB	Available UMB
E8000h-EFFFFh	24KB	Miser BIOS
F0000h-FFFFFh	64 KB	System BIOS ROM

Interrupt Controllers

Using interrupts, it is possible to change the code sequence. To change the sequence, reassign the interrupt levels. Fifteen interrupts can be used with a cascade connection of 8259INTC x 2. The table shows interrupt level assignments 0 through 15, in order of decreasing priority.

CONTROLLER MASTER/SLAVE	PRIORITY	NAME	DEVICE
Master	0	IRQ0	Timer 1 counter 0 output
Master	1	IRQ1	Keyboard (Output buffer full)
Master	2	IRQ2	INT output from controller 2
Slave	3	IRQ8	Real time clock
Slave	4	IRQ9	Reserved
Slave	5	IRQ10	Reserved
Slave	6	IRQ11	Reserved
Slave	7	IRQ12	Mouse
Slave	8	IRQ13	(Co-processor)
Slave	9	IRQ14	Hard disk controller 1
Slave	10	IRQ15	Reserved
Master	11	IRQ3	Serial port 2 (Internal Fax/Modem)
Master	12	IRQ4	Serial port 1
Master	13	IRQ5	Reserved
Master	14	IRQ6	Floppy disk controller 1
Master	15	IRQ7	Parallel port 1

C Modem Commands, Registers, and Codes

AT commands, S registers, and result codes are universally understood instructions for network communications. Most fax/modem applications automatically initialize your modem with the proper AT commands and you do not need to change anything. In case you ever do need to communicate directly with your modem, or change a setup string, the following tables list the most commonly-used AT commands, S registers, and result codes that you can use to configure and use your optional internal 14.4 Kbps data/fax modem.

AT Commands

AT commands tell the modem how to operate. Except for the escape sequence (+++) (switch to command mode) and the **A/** command (repeat last command), precede all the commands in the following table with the letters **AT**.

Entering a command without a value is the same as entering a command with zero (0) as the value. Bold indicates the default value.

AT COMMANDS

COMMAND	DESCRIPTION
A	Manual answer.
A/	Repeat last command (No **AT** needed).
AT	Attention code; precede all commands except **A/** and **+++**
B, B0	CCITT V.22 mode at 1200 bps; V.21 at 300 bps.
B1	Bell 212 A mode at 1200 bps; Bell 103 at 300 bps.
D	Dial the number that follows D in the command line. For example, ATDP555-1234 commands the modem to pulse dial the phone number 555-1234.
Modifiers:	0 to 9 — Dialing digits. A,B,C,D,*,# — Tone dial characters. P — Pulse dial. R — Reverse originate mode. S=*n* — Dials the telephone number *n* (0-3) stored with the **&Zn=x** command. T — Tone dial. **W** — Wait for dial tone. (Time specified in register S6) , — Pause. (Time specified in register S8) ! — Flash hook. @ — Wait for quiet answer. (Time specified in register S6) ; — Return to command mode. L — Dial last number.
E, E0	Disable modem echo to terminal in command mode.
E1	Enable modem echo to terminal in command mode.
H, **H0**	Go on-hook (hang up).
H1	Go off-hook.

AT COMMANDS

COMMAND	DESCRIPTION
I, I0	Display 14,400 (Identification code).
I1	Return actual checksum on ROM.
I2	Return OK/ERROR on RAM checksum.
I3	Display firmware revision.
I4	Display configuration settings.
L0, L1	Low speaker volume.
L2	Medium speaker volume.
L3	High speaker volume.
M, M0	Turn speaker off.
M1	Turn speaker on until Carrier Detect (CD).
M2	Set speaker to always on.
M3	Turn speaker on until CD except during dialing.
N0	Force line speed set by S37 register.
N1	When originating, auto line speed starting with speed set in S37 register.
O, O0	Return to Online Data mode from Online Command mode.
O1	Go online and initiate retrain.
Q, Q0	Display result codes (Quiet disabled).
Q1	Do not display result codes (Quiet enabled).
Q2	No call progress messages in answer mode.
S*r*=n	Set S register *r* to value *n*.
S*r*?	Show value in S register *r*.
V, V0	Display numeric result codes (Verbose disabled).
V1	Display full-word result codes (Verbose enabled).

AT COMMANDS

COMMAND	DESCRIPTION
W0	No negotiation progress messages, report connect at DTE speed.
W1	Return negotiation progress messages, report connect at DTE speed.
W2	No negotiation progress messages, report connect at DCE speed.
X, X0	Modem ignores dial tone and busy signal, enables and displays CONNECT result code.
X1	Modem ignores dial tone and busy signal; CONNECT speed result code enabled.
X2	Modem ignores busy signal; CONNECT speed result code enabled. (Includes dial tone detection.)
X3	Modem ignores dial tone; CONNECT speed result code enabled.
X4	Modem recognizes dial tone and busy signal; CONNECT speed result code enabled.
Y, Y0	Disable long-space disconnect.
Y1	Enable long-space disconnect.
Z, Z0	Reset modem and recall User Profile 0.
Z1	Reset modem and recall User Profile 1.
+++	Escape sequence. (Allows AT commands while online; use AT0 to go back on line.)
&C, &C0	Carrier Detect always on.
&C1	Carrier Detect follows data carrier.
&D, &D0	Modem ignores Data Terminal Ready (DTR) option.
&D1	Go to command mode for ON-to-OFF DTR transition.

COMMAND	DESCRIPTION
&D2	Hang up and go to command mode for ON-to-OFF DTR transition. (Turn off auto answer.)
&D3	Reset for ON-to-OFF DTR transition.
&F	Reset modem and recall factory defaults (only affects current user session; is not permanent.)
&G, &G0	Disable guard tones (USA setting).
&L, &L0	Operate on common dialup telephone line.
&L1	Not supported.
&M, &M0	Operate in asynchronous mode. (Same as Q0)
&P, &P0	Set pulse dial make/break ratio 39%/61% (USA/Canada) .
&P1	Set pulse dial make/break ratio 33%/67% (UK/HK).
&Q, &Q0	Use asynchronous mode.
&Q1, &Q2, &Q3	Not supported.
&Q4	Return error.
&Q5	Data connection using V.42 or MNP.
&Q6	Data connection using normal mode.
&S, &S0	Set Data Set Ready (DSR) to be always true.
&S1	Set DSR to follow CCITT V.24 specification.
&T, &T0	Terminate test.
&T1	Initiate local analog loopback test (mode selected with the command %B*n*).
&T3	Initiate local activated Remote Digital Loopback (RDL) test.
&T4	Grant request from remote for Remote Digital Loopback (RDL) test.

COMMAND	DESCRIPTION
&T5	Deny remote request for RDL test.
&T6	Initiate RDL test.
&T7	Initiate RDL test with self-test.
&T8	Initiate local analog loopback with self-test.
&V, &V0	View active configuration, profiles phone numbers, and S register contents.
&W, &W0	Save active configuration as User Profile 0.
&W1	Save active configuration as User Profile 1.
&X, &X0	Modem source transmit clock.
&Y, &Y0	Recall User Profile 0 on power up.
&Y1	Recall User Profile 1 on power up.
&Zn=x	Store telephone number *x* in directory entry *n* (*n*=0-3, *x*=36 characters maximum.) For example, to store phone number (555)555-5555, you enter AT&Z0=5555555555. This stores the phone number in position 0. To dial the number, issue the following command: ATDS=0
\G0	Turn off Xon/Xoff software flow control. (See also \Q3 hardware flow control).
\G1	Turn on Xon/Xoff software flow control.
\N0	Normal mode (non MNP, buffered data)
\N1	Direct mode (non MNP, data not buffered)
\N2	Reliable MNP mode (Attempts MNP connection; if unsuccessful, then disconnects.)
\N3	Auto reliable mode (MNP if remote is MNP; otherwise, normal.)
\N4	Reliable LAPM mode.
\N5	Auto-reliable LAPM and buffer mode.

AT COMMANDS

COMMAND	DESCRIPTION
\N6	Auto-reliable LAPM, MNP, and buffer mode.
\Q0	Disable DTE flow control.
\Q1	Bi-directional Xon/Xoff.
\Q2	Unidirectional CTS interface signal.
\Q3	Bidirectional hardware flow control. (RTS/CTS)
\T0	Disconnects if no activity for specified time; use values 0-90 (seconds). If value = 0 (default), the time is disabled.
\V0	Disable MNP responses.
\V1	Enable MNP responses.
%C0	Disable Data Compression.
%C1	Enable Data Compression.
%E0	Disable Auto Retrain.
%E1	Enable Auto Retrain.
#CC0	Disable Caller ID.
#CC1	Format modem for single message sent to DTE.

S Registers

The modem provides S registers to let you control many of its parameters. Some of these S registers are Read-Only (RO) registers. Some are bit mapped. For bit-mapped S registers, each option controlled by the register is assigned a bit. The state of the bit determines whether the option is enabled. The value of the S register is then set by adding the values of all bits representing enabled options.

S Register

REGISTER	DEFAULT	DESCRIPTION
S0	0	Auto-answer on number of rings.
S1	0	Ring count.
S2	43	Escape Character (+) (ASCII value in decimal; disabled above 127)
S3	13	Carriage Return character code (ASCII value in decimal).
S4	10	Line Feed character code (ASCII value in decimal).
S5	08	Backspace character code (ASCII value in decimal).
S6	02	Seconds to wait before dialing without detecting dial tone.
S7	40	Seconds to wait for carrier after dial.
S8	02	Seconds to pause for comma (,) dial modifier.
S9	06	Tenths of seconds for Carrier Detect (CD) response time
S10	14	Tenths of seconds to detect Carrier loss time.
S11	75	DTMF tone and pause duration.
S12	40	Return to data mode timer.

S Register

REGISTER	DEFAULT	DESCRIPTION
S14	170	Read-only bit mapped register.
S16	00	Read-only bit mapped test register.
S18	00	Modem test timer in seconds.
S21	00	Read-only bit mapped.
S22	118	Read-only bit mapped.
S23	21	Read-only bit mapped.
S25	05	DTR delay detect timer in seconds.
S26	01	.01-second delay from RTS true to CTS true.
S27	64	Read-only bit mapped.
S37	00	Maximum DCE line speed. Use the following values (See also **ATN** command): 0 =Speed of last AT command issued. 1 = 75 bps 2 = 110 bps 3 = 300 bps 5 = 1200 bps 6 = 2400 bps 7 = 4800 bps 8 = 7200 bps 9 = 9600 bps 10 =12000 bps 11 = 14400 bps

Result Codes

The following table shows the numeric and verbose forms of result codes the modem returns.

RESULT CODES

NUMERIC	VERBOSE	DESCRIPTION
0	OK	Command executed.
1	CONNECT	Connection at 300 bps.
2	RING	Ring signal detected.
3	NO CARRIER	Carrier signal not detected or lost.
4	ERROR	Invalid command, checksum, error in command line, or command line too long (exceeds 40 characters).
5	CONNECT 1200	Connection at 1200 bps; disabled by X0.
6	NO DIAL TONE	No dial tone detected; enabled by X2, X4, or W dial modifier.
7	BUSY	Busy signal detected; enabled by X3 or X4.
8	NO ANSWER	No silence detected when dialing a system not providing dial tone; enabled by @ dial modifier.
10	CONNECT 2400	Connection at 2400 bps; disabled by X0.

(For United States Use Only)

FEDERAL COMMUNICATIONS COMMISSION
RADIO FREQUENCY INTERFERENCE STATEMENT

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures.

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Use shielded and properly grounded I/O cables and power cable to ensure compliance of this unit to the specified limits of the rules.

(For Canadian Use Only)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B repecte toutes les exigences du Règlement sur le matériel brouillage du Canada.

BATTERY REPLACEMENT

A lithium battery in your computer maintains system configuration information. In the event that the battery fails to maintain system configuration information, NEC recommends that you replace the battery.

WARNING: There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

ATTENTION: Il y a danger d'explosion s'il y a replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

BATTERY DISPOSAL

Your bridge battery (not your main battery) is made of nickel-cadium (Nicad). the Nicad bridge battery must be collected, recycled, or disposed of in an environmentally-approved manner.

Your main battery, made of Lithium Ion (Li-Ion), and your CMOS lithium battery are not recyclable.

The incineration, landfilling, or mixing of Nicad batteries with the municipal solid wasted stream is prohibited by law in most areas.

Return Nicad batteries to a federal or state-approved recycler.

This may be where you purchased the battery or a local seller of automotive batteries. In MINNESOTA, call 1-800-225-PRBA if you need further disposal information.

Contact your local waste management officials for other information regarding the environmentally sound collection, recycling, and disposal of the batteries.